

## **DRAFT FOR INTERNAL USE ONLY**

### **Current Status of Hood Canal Nutrient Modeling**

There is no water quality model of Hood Canal at this time. A mathematical model is needed to provide critical information for water quality restoration effort, such as:

- 1) Natural Condition - estimates of the natural dissolved oxygen conditions in Hood Canal and the degree to which current conditions are worse
- 2) Source Assessment - estimates of the relative impacts on dissolved oxygen of nutrient pollution sources
- 3) Water Quality Goals - estimates of future conditions based on pollution reduction
- 4) Regulatory Plan - estimates necessary for development of a TMDL or other plan

### **Two Model Development Tracks**

The Hood Canal Low Dissolved Oxygen Program (HCDOP) is currently coordinating an extensive monitoring effort throughout Hood Canal and adjacent watersheds. This monitoring data will be critically important to the development and testing of the water quality models.

The HCDOP also includes a plan for the University of Washington to develop a water quality model for Hood Canal. In consultation with Ecology, EPA has raised practical concerns about the HCDOP model development plan (see letter from Christine Psyk to co-leads of HCDOP dated September 9, 2005):

- water quality components (as opposed to the hydrodynamic components) of the model will require development of new model software instead of using available, peer reviewed model software that can provide similar predictions
- computer resource requirements of the selected model programs may exceed our agencies' computer resources
- HCDOP funding is year-to-year and uncertain, while Ecology staff can maintain and update a model over the long term if necessary

Based on these concerns, EPA and the Department of Ecology are planning to develop a second water quality model for Hood Canal. This model will be developed for a desktop environment on a relatively short timeline, using off-the-shelf water quality modeling software (likely the GEMSS model software applied in other Puget Sound embayments). From a scientific perspective, a second model is not a wasteful duplication. Multiple models are often employed in an attempt to gain more confidence in model results (e.g., global climate models and climate change). From a practical perspective, the Department of Ecology needs a model in a short time frame to guide restoration planning, and they need to be able to run the model in Lacey to support decisionmaking.

If funding is approved in Spring 2006, Ecology could complete a calibrated/peer-reviewed model in the 2007 calendar year.